UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/517,898	03/03/2000	Ronald Vogels		5448

7590 07/01/2003

Allen C Turner
Trask Britt & Rossa
P O Box 2550
Salt Lake City, UT 84110

EXAMINER	
LI, QIAN J	

ART UNIT	PAPER NUMBER
1632	27

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/517,898	Applicant(s) VOGELS ET AL.	
	Examiner Q. Janice Li	Art Unit 1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,18,20,22,27 and 47-50* is/are pending in the application.

4a) Of the above claim(s) *49 and 50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,18,20,22,27,47 and 48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *24* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

The amendment and response filed 4/10/03 have been entered as paper #26. Claims 1, 3, 18, 20, 22, and 27 have been amended, claims 2, 4-17, 19, 21, 23-26, 28-46 have been canceled, and claims 47-50 are newly submitted.

It is noted that new claims 49 and 50 are drawn to a non-elected invention (group III), and the election was made **without** traverse in Paper No. 13. Therefore, claims 49 and 50 are withdrawn from consideration in this application. Claims 1, 3, 18, 20, 22, 27, 47, and 48 are under current examination.

Unless otherwise indicated, previous rejections that have been rendered moot in view of the amendment to pending claims will not be reiterated. The arguments in paper #26 would be addressed to the extent that they apply to current rejection.

This application contains claims 49 and 50 drawn to an invention nonelected without traverse in Paper No. 13. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

WRITTEN DESCRIPTION REQUIREMENT

The prior rejection of claims 1-11, 18-22, 27, and 35-46 is withdrawn in view of claim amendment.

ENABLEMENT REQUIREMENT

The prior rejection of claims 1-11, 18-22, 27, and 35-46 has been modified in view of the claim amendment, and the rejection now applies to claims 1, 18, 20, 22, 27, and 47 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1 and 22 as amended are drawn to a recombinant adenovirus comprising at least a knob domain of a fiber protein of *Ad16,* and at least one protein from adenovirus subgroup *C*, encompassing at least four different serotypes of adenoviruses. Claim 27 is drawn to a method of using such for delivery a gene of interest into synovial cavity. Claim 20 as amended is drawn to a recombinant adenovirus comprising at least one protein from adenovirus subgroup *C*, and at least a knob domain of a fiber protein from *any* adenoviral serotype.

In paper #26, Applicant states that the specification indicates that the recombinant adenovirus Ad5.fib16luc does infect synoviocytes more efficiently than Ad5.luc and less luciferase activity was detected in the liver when Ad5.fib16luc was injected into rats, thus, claims are enabled.

In response, the amended claims are not limited to Ad5.fib16luc and methods of using such. The specification does not support the full scope of the claims because the claims encompass any adenoviral vector from subgroup C, not limited to Ad5, and the fiber knob domain could be any adenoviral viral fiber knob domain including Ad5 itself, not limited to Ad16. As discussed in detail in paper #22, the tissue tropism of a recombinant adenovirus with a hybrid fiber knob could not be reasonably predicted. For example, *Mei et al* (Virol 1998;240:254-66) teach that two strains of the same serotype Ad11 isolated from two different patients differ in their binding ability to epithelial cells of various origins. *Wickham et al* (US 6,455,314) teach particularly regarding altering cell affinity of adenovirus, "FAR MORE DESIRABLE IS AN ADENOVIRUS WHICH INFECTS ONLY A DESIRED CELL TYPE, AN APPROACH REFERRED TO AS "ALTERNATIVE TARGETING", "EFFORTS AIMED AT ABROGATING NATIVE ADENOVIRAL CELL AFFINITY HAVE FOCUSED LOGICALLY ON CHANGING THE FIBER KNOB. THESE EFFORTS HAVE PROVEN DISAPPOINTING, LARGELY BECAUSE-THEY FAIL TO PRESERVE THE IMPORTANT FIBER PROTEIN FUNCTIONS OF STABLE TRIMERIZATION AND PENTON BASE BINDING" (column 3, lines 21-55). Neither art of record nor the instant specification teaches a core structure-functional relation that target the vector only to certain type of cells.

Moreover, the claims as amended do not place any structural limitation as to the relative position and relation of the knob domain. One cannot extrapolate the teachings of the specification to the scope of the claims because the skilled artisan cannot envision the detailed trimerization and resulting function of any given combination of the fiber knob proteins and their functional derivative/or analogue encompassed by these claims and whether they can produce the desired targeting effect. Therefore, undue

experimentation is required for making and using these recombinant adenoviruses for targeting synovial cells. Accordingly, the rejection stands.

The previous rejection under 35 U.S.C. 112, first paragraph, with respect to routes of administering the vector, is withdrawn because claim 27 as amended is drawn to direct introduction of a recombinant adenovirus into the synovial cavity.

The previous rejection under 35 U.S.C. 112, first paragraph, with respect to therapeutic effect of the claimed method, is withdrawn because example 10 of the specification illustrated a therapeutic effect for collagen induced arthritis in monkeys by intra-articular injection of IG.Ad.Clip.TK.fib16.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, 18, 20, 22, 47, and 48 are newly rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague and indefinite because claims 1, 20, and 22 recite, "at least one protein of an adenovirus of subgroup C origin *associated* with the recombinant adenovirus's capsid", and "at least a knob domain of a fiber protein of adenovirus 16 *associated* with the recombinant adenovirus's capsid". The phrase could be interpreted as 1) the one protein of Ad-C (or the knob domain) is physically associated with the

capsid of the recombinant Adv, or 2) the one protein is from the Ad-C capsid (or from the adenovirus's capsid), it is unclear which meaning applicants intend to claim, thus, the metes and bounds of the claims are uncertain.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The prior rejection of claims 1-4, 18, 27, 35, 36, and 43 under 35 U.S.C. 102(b) as being anticipated by *Maxwell et al* (US 5,585,254), is withdrawn because amended claims are limited to adenovirus.

The previous rejection of claims 1-8, 10, 11, 18-21, 27, 35-38, 41, 43, and 44 under 35 U.S.C. 102(b) as being anticipated by *Stevenson et al* (J Virol 1997;6:4782-90), now applies to amended claim 20.

Claim 20 is drawn to a recombinant adenovirus comprising at least one protein from Ad subgroup C, at least a knob domain of a fiber protein from any Ad serotype, a

nucleic acid of interest, and a subgroup B adenoviral nucleic acid incorporated into the recombinant Adv.

In Paper 26, Applicant states that the prior art does not anticipate claims as amended. However, *Stevenson et al* teach a recombinant adenovirus comprising a chimeric fiber cDNA containing the Ad3 (subgroup B) fiber head domain fused to the Ad5 (subgroup C) capsid fiber protein incorporated into the genome of an adenovirus vector, and encoding β-galactosidase (nucleic acid of interest, see abstract). The vector has a modified Ad5 capsid protein and a capsid comprising proteins from subgroups B and C, thus, meet claim limitation. Therefore, *Stevenson et al* anticipate instant claims.

Prior rejection of claims 1-6, 18, 35, 36, 43 under 35 U.S.C. 102(e) as being anticipated by *Wickham et al* (US 6,329,190), now applies to amended claim 20.

In Paper 26, Applicant states that the prior art does not anticipate claims as amended. However, *Wickham et al* teach a recombinant adenoviral vector (e.g. figure 11) comprising a chimeric adv fiber hybrid between an Ad5 fiber shaft and a Ad2 fiber knob (both of subgroup C, fig. 1), wherein the rbAdv is an adenovirus from subgroup B (column 13, liens 5-20). Therefore, *Wickham et al* anticipate the instant claims.

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Q. Janice Li whose telephone number is 703-308-7942. The examiner can normally be reached on 8:30 am - 5 p.m., Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah J. Reynolds can be reached on 703-305-4051. The fax numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9307 for After Final communications.

Any inquiry of formal matters can be directed to the patent analyst, Dianiece Jacobs, whose telephone number is (703) 305-3388.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235. The faxing of such papers must conform to the notice published in the Official Gazette 1096 OG 30 (November 15, 1989).

Q. Janice Li
Examiner
Art Unit 1632

QJL
June 27, 2003

ANNE M. WEHBE' PH.D
PRIMARY EXAMINER